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GORDIUS LARVAE PARASITIC IN A TREMATODE*

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During the summer of 1914 while carrying on investigations at the University of Michigan Biological Station, Douglas Lake, Michigan, I collected some trematodes which contained in their parenchyma early developmental stages of Gordius larvae. This observation seems worth reporting, especially since no record has been found of a trematode parasitized by another animal.

These trematodes, which belong to the species *Brachycoelium hospitale* Stafford, were found in the intestines of specimens of the green newt (*Diemictylus viridescens*) from a small beach pool on the north side of Douglas Lake. The anatomy of this fluke has been described by Stafford (1903 : 824). The infection of the Douglas Lake newts while not particularly heavy is considerably greater than that reported by him. Of nineteen individuals of *Diemictylus viridescens* examined, thirteen were infected with a total of thirty-seven specimens of *Brachycoelium hospitale,* the greatest number in one host being eight.

The accidental finding of a Gordius larva coiled up in the parenchymatous tissue of one of the trematodes led to further examination. In all, sixteen of the trematodes were examined carefully for the presence of these larvae. Eight of them from several different hosts were infected, two containing two larvae and the others one each. The Gordius larvae were found in various positions: one was next to the oral sucker, another just anterior to the ovary, and others near the testes or further posteriad among the uterine coils (Fig. 1).

The Gordius larvae in the trematodes were in a very early stage of development, being but little beyond the condition found in fully developed eggs. They floated freely in spaces in the parenchymatous tissue. No spontaneous movement was noted and there was no indication of a cyst. The larvae were coiled very tightly; the anterior end appeared truncated, and the proboscis entirely retracted. The posterior extremity was terminated by a short spine (Fig. 2). There was no indication that the larvae were continuing their development in the tissues of the trematode.

Early larval stages of the Gordiacea have been found in a large variety of aquatic animals. Villot (1891 : 338) states that the "embryo" of *Gordius aquaticus* has been found in the mesenteries of *Rana tem-*

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poraria, in aquatic insect larvae (*Tanypus, Corethra, Chironomus*), in the parenchyma of leeches, in the mucous membrane of the intestine of fishes, and even in the foot of snails. Which of these are normal hosts is a matter of dispute, some authorities favoring the insect larvae and some the fishes. The presence of Gordius larvae in trematodes from the intestine of the newt is without doubt a case of accidental parasitism, the larvae ingested by the newt having sought to escape the intestinal juices by boring into the trematodes. That the trematode can have any normal place in the life-history of Gordius is evidently unlikely since the adult trematode finishes its life in the intestine of its host and under these conditions the encysted larvae can hardly reach a place suited for further development. Probably after hatching from the egg Gordius larvae by the use of their extraordinary boring apparatus are able to make their way into almost any aquatic animal.

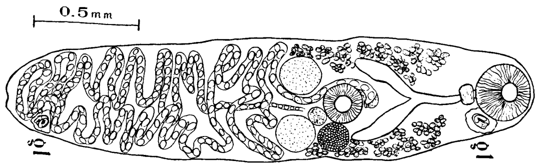

Fig. 1.—A specimen of *Brachycoelium hospitale* containing two Gordius larvae (*gl*). X 28.

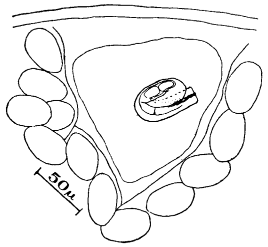

Fig. 2.—Gordius larva in parenchyma of posterior end of fluke shown in Figure 1. X 160.

Many of them wander into places where development stops; but the continuation of the species depends on a few of the myriads hatched finding some normal host, i. e., one in which complete development is possible. The life history thus appears to be only roughly adjusted and to lack the precise relations shown by many other parasitic species.

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